

ACCESSION #: 9609250130

LICENSEE EVENT REPORT (LER)

FACILITY NAME: North Anna Power Station Unit 1 PAGE: 1 OF 4

DOCKET NUMBER: 05000338

TITLE: REACTOR TRIP ON HIGH NEGATIVE FLUX RATE

EVENT DATE: 08/27/96 LER #: 96-005-00 REPORT DATE: 09/18/96

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:

50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:

NAME: Mr. W. R. Matthews TELEPHONE: (540) 894-2101

COMPONENT FAILURE DESCRIPTION:

CAUSE: B SYSTEM: AA COMPONENT: AMP MANUFACTURER: W120

REPORTABLE NPRDS: Y

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On August 27, 1996, at 1004 hours, while performing a quarterly rod operability periodic test, Unit 1 experienced an automatic reactor trip from 100 percent power. The reactor trip initiating signal was "Hi Flux Rate - Reactor Trip" which caused a reactor and turbine trip when multiple rods "B" Control Bank, Group 2 tripped in from the fully withdrawn position of 225 steps. An ESF actuation subsequently followed, as designed, with the auto-starting of the Auxiliary Feed Water System on Steam Generator Low - Low level.

The cause of the event has been determined to be failure of the Control Rod Drive System to supply a full current - stationary current order to Group 2 of Control Bank "B". This allowed multiple rods in "B" Control Bank, Group 2 to fall into the core and cause a

high negative flux rate reactor trip.

A four (4) hour report was made to the NRC Operations Center at 1109 hours on August 27, 1996, in accordance with 10 CFR 50.72 (b) (2) (ii). This event is reportable pursuant to 10 CFR 50.73 (a)(2)(iv) for a condition that resulted in an automatic actuation of an engineered safety feature, including the reactor protection system.

This event posed no significant safety implications since all safety systems responded as designed. Therefore, the health and safety of the public were not affected at any time during this event.

TEXT PAGE 2 OF 4

TEXT PAGE 2 OF 4

1.0 Description of the Event

On August 27, 1996, at 1004 hours, while personnel were performing a quarterly rod operability periodic test (1-PT-17.1), Unit 1 experienced an automatic reactor trip from 100 percent power. Testing of Control Banks C and D had been successfully completed, however, when the Control Room Operator started to insert "B" Control Bank, the reactor trip occurred.

The reactor trip initiating signal, was "Hi Flux Rate - Reactor Trip", which caused a reactor and turbine trip when multiple rods in "B" Control Bank, Group 2 tripped in from the fully withdrawn position of 225 steps. An ESF actuation subsequently followed, as designed, with the auto-starting of the Auxiliary Feed Water System [EHS System BA] on Steam Generator [EHS System AB] Low - Low level.

Initial investigation determined that the event was caused by a faulty input/output (I/O) isolation amplifier card in the Control Rod Drive System [EHS System AA; Component AMP] which failed to supply a full

current - stationary current order to Control Bank "B", Group 2. This allowed multiple rods in "B" Control Bank, Group 2 [EHS System AA; Component ROD] to fall into the core and cause a high negative flux rate reactor trip.

Control Room personnel responded to the reactor trip in accordance with procedure E-0 Reactor Trip or Safety Injection. Initially, Reactor Coolant System (RCS) [EHS System AB] pressure decreased to approximately 1950 psig and RCS temperature decreased to approximately 543 degrees F. Pressurizer pressure, level and RCS temperature subsequently returned to their normal programmed values. All ESF equipment responded as designed. Control Room personnel entered Abnormal Procedure AP-14 to address a loss of condenser vacuum. After adjustments to the Gland Steam System [EHS System KO] were made, condenser vacuum returned to normal. RCS temperature control was accomplished via the steam generator atmospheric power operated relief valves [EHS System AB; Component RV] from 1045 hours to 1251 hours while condenser vacuum was being restored.

2.0 Significant Safety Consequences and Implications

This event posed no significant safety implications since all safety systems responded as designed. Therefore, the health and safety of the public were not affected at any time during this event.

3.0 Cause of the Event

The cause of the event has been determined to be the result of a faulty I/O Isolation amplifier card in the Control Rod Drive System which failed

to supply a full current - stationary current order to "B" Control Bank, Group 2. A reduced current signal was supplied to the stationary

TEXT PAGE 3 OF 4

3.0 Cause of the Event (continued)

coils rather than a full current signal. This allowed multiple rods in "B" Control Bank, Group 2 to fall into the core and cause a high negative flux rate reactor trip.

4.0 Immediate Corrective Actions

Operations Emergency Procedure E-0 - Reactor Trip or Safety Injection was entered. Initially, Reactor Coolant System (RCS) pressure decreased to approximately 1950 psig and RCS temperature decreased to approximately 543 degrees F. Pressurizer pressure, level and RCS temperature subsequently returned to their normal programmed values.

A four (4) hour report made to the NRC Operations Center at 1109 hours on August 27, 1996, in accordance with 10 CFR 50.72 (b) (2) (ii).

North Anna Unit 1 remained in Mode 3 until all necessary repairs were completed. The unit was subsequently returned to service on August 29, 1996.

5.0 Additional Corrective Actions

I/O isolation amplifier card A813 was replaced in the Control Rod Logic Cabinet.

The failed I/O isolation amplifier card was tested to determine the cause of failure. Testing was unable to duplicate the failure.

A Root Cause Evaluation was initiated to determine the cause of the failed I/O isolation amplifier card and develop corrective actions to prevent recurrence. Amplifier card pin failure was assumed to be the probable cause of this event.

6.0 Actions to Prevent Recurrence

Corrective Actions resulting from the Root Cause Evaluation will be reviewed by Management and implemented, as necessary.

7.0 Similar Events

No similar events attributed to an I/O isolation amplifier card failure have resulted in previous reactor trips.

TEXT PAGE 4 OF 4

8.0 Additional Information

The following secondary equipment malfunctions were identified during the Post-Trip Review and resolved prior to Unit re-start:

"C" MSR Reheat flow control valve failed to close.

Leaking "A" and "C" Feedwater regulating valves.

Chart Recorders for "A" Steam Generators was found broken and "C"

Steam Generator feed flow indication stuck at the 100% flow value.

"B" Low Pressure Heater Drain Pump Discharge check valve failed to close.

"B" Low Pressure Heater Drain Pump auxiliary oil pump thermaled out.

Main Turbine turning gear failed to automatically engage.

Two MSR fourth pass heater vents to the condenser would not operate.

1st, 5th and 6th point FW Heater RV Valves lifted and required manual isolation before reseating.

Condenser vacuum decreased due to Gland Steam Dumps being left open.

Safety Parameter Display System failed 3 to 5 minutes into the event. Data was still gathered during that time frame for assessment.

During this period, Unit 2 was operating at 100% power and was not affected by this event

ATTACHMENT 1 TO 9609250130 PAGE 1 OF 1 ATTACHMENT 1 TO 9609250130
PAGE 1 OF 1

10 CFR 50.73

Virginia Electric and Power Company

North Anna Power Station

P. O. Box 402

Mineral, Virginia 23117

September 18, 1996

U. S. Nuclear Regulatory Commission NAPS: JRP

Document Control Desk Docket No. 50-338

Washington, D.C. 20555 License No. NPF-4

Dear Sirs:

Pursuant to North Anna Power Station Technical Specifications, Virginia Electric and Power Company hereby submits the following Licensee Event Report applicable to North Anna Unit 1.

Report No. 50-338/96-005-00

This Report has been reviewed by the Station Nuclear Safety and Operating Committee and will be forwarded to the Management Safety Review Committee for its review.

Very truly yours,

W. R Matthews

Station Manager

Enclosure:

cc: U.S. Nuclear Regulatory Commission

101 Marietta Street, N.W.

Suite 2900

Atlanta, Georgia 30323

R. D. McWhorter

NRC Senior Resident Inspector

North Anna Power Station

*** END OF DOCUMENT ***
